CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

NABL - Accredited Laboratory as per ISO / IEC-17025 :2005

T-2377

Job No.: CTCE/BBMP/W.No.02/KRIDL/CSR-03/780a/CUBE/2014-15 17.04.2015

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager,** KRIDL, Bangalore.
* Name of the work	: Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	: AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 17.04.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	20.03.2015	17.04.2015	8.190	478.3	21.26
2	20.03.2015	17.04.2015	8.265	492.3	21.88
3	20.03.2015	17.04.2015	8.315	510.2	22.68

* Information is furnished by the Customer/Representative

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Job No.: CTCE/BBMP/W.No.02/KRIDL/CSR-03/780a/CUBE/2014-15 18.04.2015

TEST REPORT ON CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager,** KRIDL, Bangalore.
* Name of the work	: Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	: AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 18.04.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	21.03.2015	18.04.2015	8.180	478.3	21.26
2	21.03.2015	18.04.2015	8.290	493.6	21.94
3	21.03.2015	18.04.2015	8.325	512.3	22.77

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Job No.: CTCE/BBMP/W.No.02/KRIDL/CSR-03/780a/CUBE/2014-15 18.04.2015

TEST REPORT ON CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
* Agency	: **Technical Manager,** KRIDL, Bangalore.
* Name of the work	: Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	: AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{20}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 18.04.2015

Sl.No.	* Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	21.03.2015	18.04.2015	8.269	485.5	21.58
2	21.03.2015	18.04.2015	8.325	493.6	21.94
3	21.03.2015	18.04.2015	8.478	518.3	23.04

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Job No.: CTCE/BBMP/W.No.02/KRIDL/CSR-03/780a/Pre Cast Slab/2014-15 25.03.2015

TEST REPORT ON CONCRETE CORE (PRE CAST SLAB)

* Name of Customer	:	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
* Name of Agency	:	**Technical Manager,** KRIDL, Bangalore.
* Name of work	:	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	:	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Techinical Reference	:	IS:516-1959 (Reaffirmed 2008), SP-24:1983.
Sample ID	:	Pre cast slab
Sample Received on	:	20.03.2015
Date of Testing	:	25.03.2015

Sl. No.	Dia of Core D (mm)	Height of Core H (mm)	Core Wt (Kg)	Density of Core (kg / m^3)	H / D	Correction factor (Based on H/D)	Failure Load (kN)	Core Strength (N/mm^2)	Correction Factor for the Dia. (Strength of the Core x 1.08)	Corrected Cylinder Compressive Strength (N/mm^2)	Equivalent Cube Compressive Strength (N/mm^2)
1	50.00	79.00	0.390	2514.25	1.58	0.955	32.00	16.30	17.60	16.81	21.01
2	50.00	80.00	0.396	2521.01	1.60	0.960	32.85	16.73	18.07	17.35	21.68
3	50.00	81.00	0.403	2533.90	1.62	0.965	33.65	17.14	18.51	17.86	22.33

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Job No.: CTCE/BBMP/W.No.02/KRIDL/WMM/Gradation/2014-15 18.03.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.

Reference : AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015

Date of Testing : 18.03.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **29285**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	730	730	2.5	97.5	95-100
22.4	6000	6730	23.0	77.0	60-80
11.2	6250	12980	44.3	55.7	40-60
4.75	5250	18230	62.3	37.7	25-40
2.36	4515	22745	77.7	22.3	15-30
0.600	1985	24730	84.4	15.6	8-22
0.075	3300	28030	95.7	4.3	0-8

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18.03.2015

GRADATION FOR WMM
MORTH TABLE-400-11

Customer : **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.

Agency : **Technical Manager,** KRIDL, Bangalore.

Name of Work : Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.

Reference : AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015

Date of Testing : 18.03.2015

Material : WMM

Sample Location : WMM Mix Plant

Oven Dry Wt (gm): **29350**

Is Sieve Size in mm	Weight Retained (gm)	Cumulative Weight Retained (gm)	Cumulative % of Retained	Cumulative % of Passing	Spec.Limits
53	0	0	0	100	100
45	610	610	2.1	97.9	95-100
22.4	5895	6505	22.2	77.8	60-80
11.2	6250	12755	43.5	56.5	40-60
4.75	5415	18170	61.9	38.1	25-40
2.36	4520	22690	77.3	22.7	15-30
0.600	1960	24650	84.0	16.0	8-22
0.075	3315	27965	95.3	4.7	0-8

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Job No.: CTCE/BBMP/W.No.02/KRIDL/WMM/AIV/2016-17

18.03.2015

Aggregate Impact Value

IS: 2386 Part IV

Client	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	18.03.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	392	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	88	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	303	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.62	22.70	22.66

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.02/KRIDL/WMM/S-T/2016-17 18.03.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	18.03.2015

Result : Flakiness Index = **12.30%**

Elongation Index = **13.20%**

Result : Combined Flakiness & Elongation index 25.50%

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

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Job No.: CTCE/BBMP/W.No.02/KRIDL/CSR-03/780a/QB(BM)/2014-15 23.03.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
*AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
*NAME OF THE WORK	:	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	21.03.2015
DATE OF TESTING	:	23.03.2015

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	88	80 to 100
2	Softening point, °C	IS :1205 -1978 (RA-2009)	46	Min. 40
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	298	Min. 220

*Information is furnished by the Customer/Representative.

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Job No: CTCE/BBMP/W.No.02/KRIDL/BM/AIV/2014-15 23.03.2015

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Source / Location	Hotmix Plant, Bangalore
Type of Mix	Bituminous Macadam
Date of Testing	23.03.2015

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	385	386	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	84	85	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	301	301	
4	Aggregate Impact value = percent fines	21.82	22.02	
	$100^* (W_2/W_1)\%$			21.92

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Comments:

→ Maximum allowable Aggregate Impact value for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.02/KRIDL/BM/Shape.T/2014-15 : 23.03.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	: **Technical Manager,** KRIDL, Bangalore.
Name of Work	: Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	: AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Technical Reference	: IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	: Bituminious Macadum
Date of Testing	: 23.03.2015

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Flakiness Index = **12.56%**

Elongation Index = **13.89%**

Result : Combined Flakiness & Elongation index **26.45%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Bituminous Macadam is 30%

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Job No: CTCE/BBMP/W.No.02/KRIDL/BM/Stripping/2014-15 24.03.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Type of Mix	Bituminous Macadam
Date of Testing	24.03.2015

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.3	3.40	96.60
2	3.4		
3	3.5		

Comments:

→ Minimum allowable Aggregate retained coating for Bituminous Macadam is 95%

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Job No: CTCE/BBMP/W.No.02/KRIDL/BM/Sp_Wa/2014-15 24.03.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Source / Location	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	24.03.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 2	
1	Weight of aggregate suspended in water with the basket	W_1 g	2005	2006	2007	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1255	1256	1257	
4	Weight of saturated surface dry aggregate in air	W_3 g	2026	2027	2028	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_5)$ g	771	771	771	
6	Weight of oven dried aggregate	W_4 g	2012	2013	2014	
7	Specific Gravity	$W_4/(W_3-W_5)$	2.610	2.611	2.612	2.611
8	Apparent Specific gravity	$W_4/(W_4-W_5)$	2.658	2.659	2.661	2.659
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.70%	0.70%	0.70%	0.70%

Comments:

→ Maximum allowable Aggregate Water absorption value for Bituminous Macadam is 2.0%

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Job No: CTCE/BBMP/W.No.02/KRIDL/BM/Agg.G/2014-15 24.03.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Sample ID	Hotmix Plant, Bangalore.
Type of Mix	Bituminous Macadam
Date of Testing	24.03.2015

Total Weight of Sample: 5250 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	360	6.86	6.86	93.14	90-100	
13.2	1650	31.43	38.29	61.71	56-88	
4.75	1485	28.29	66.57	33.43	16-36	
2.36	925	17.62	84.19	15.81	4-19	
0.3	380	7.24	91.43	8.57	2-10	
0.075	160	3.05	94.48	5.52	0-8	

Total Weight of Sample: 5300 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
26.5	0	0	0	100	100	Gradation satisfies Grade-II MORTH specification
19	310	5.85	5.85	94.15	90-100	
13.2	1685	31.79	37.64	62.36	56-88	
4.75	1525	28.77	66.42	33.58	16-36	
2.36	925	17.45	83.87	16.13	4-19	
0.3	460	8.68	92.55	7.45	2-10	
0.075	180	3.40	95.94	4.06	0-8	

Note:

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Job No: CTCE/BBMP/W.No.02/KRIDL/CSR-03/780a/SDBC(QB)/2014-15 26.03.2015

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
*AGENCY	:	**Technical Manager,** KRIDL, Bangalore.
*NAME OF THE WORK	:	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
REFERENCE	:	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	24.03.2015
DATE OF TESTING	:	26.03.2015

The results of the tests conducted on the bitumen sample using for Semi Dense Bituminous Concrete.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	86	80 to 100
2	Softening point, °C	IS :1205 -1978 (RA-2009)	45	Min. 40
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 75
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	304	Min. 220

*Information is furnished by the Customer/Representative.

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VISHWANATH. I.A.
Chief Executive Officer

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Job No.: CTCE/BBMP/W.No.02/KRIDL/SDBC/Shape_T/2014-15 26.03.2015

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Technical Reference	IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	26.03.2015

Result : Flakiness Index = **11.35%**

Elongation Index = **13.25%**

Result : Combined Flakiness & Elongation index **24.60%**

Comments:

→ Maximum allowable Flakiness & Elongation Index for Semi Dense Bituminous Concrete is 30%

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Job No.: CTCE/BBMP/W.No.02/KRIDL/SDBC/Stripping/2014-15 27.03.2015

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	27.03.2015

Type of binder : 80/100
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.3	3.30	96.70
2	3.2		
3	3.4		

Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

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Job No.: CTCE/BBMP/W.No.02/KRIDL/SDBC/Sp_Wa/2014-15 27.03.2015

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	27.03.2015

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2020	2021	2022	
2	Weight of basket suspended in water	W_2 g	750	750	750	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_s$ g	1270	1271	1272	
4	Weight of saturated surface dry aggregate in air	W_3 g	2016	2017	2018	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_S)$ g	746	746	746	
6	Weight of oven dried aggregate	W_4 g	2001	2004	2003	
7	Specific Gravity	$W_4/(W_3-W_S)$	2.682	2.686	2.685	2.685
8	Apparent Specific gravity	$W_4/(W_4-W_S)$	2.737	2.734	2.740	2.737
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.75%	0.65%	0.75%	0.72%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/W.No.02/KRIDL/SDBC/AGG/2014-15 27.03.2015

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Technical Manager,** KRIDL, Bangalore.
Name of the Work	Improvements to drains and providing Asphalting to Main and Cross Roads of Yelahanka New Town 5th Phase in Ward No. 02 of Yelahanka Sub Division, BBMP, Bangalore.
Reference	AEE/BBMP/YSD/AE-2/2014-15 Dated: 04.03.2015
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	27.03.2015

Total Weight of Sample: 5300 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	420	7.9	7.92	92.08	90-100	
4.75	2850	53.8	61.70	38.30	35-51	
2.36	700	13.2	74.91	25.09	24-39	
1.18	400	7.5	82.45	17.55	15-30	
0.3	300	5.7	88.11	11.89	9-19	
0.075	325	6.1	94.25	5.75	3-8	

Total Weight of Sample: 5400 gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	320	5.9	5.93	94.07	90-100	
4.75	2905	53.8	59.72	40.28	35-51	
2.36	630	11.7	71.39	28.61	24-39	
1.18	420	7.8	79.17	20.83	15-30	
0.3	320	5.9	85.09	14.91	9-19	
0.075	400	7.4	92.50	7.50	3-8	

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